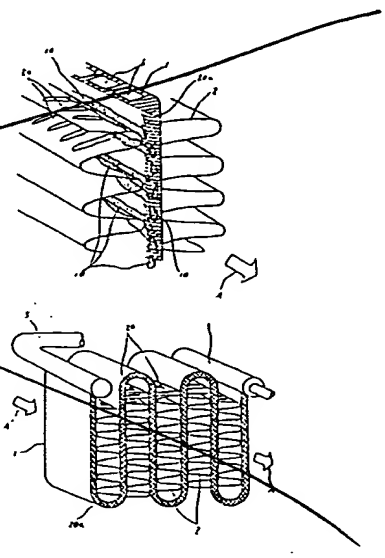
(54) HEAT EXCHANGER
(11) 62-252890 (A) (43) 4.11.1987 (19) JP
(21) Appl. No. 61-94522 (22) 25.4.1986
(71) HITACHI LTD (72) MITSUO KUDO(3)
(51) Int. Cl⁴. F28D1/047

PURPOSE: To provide a heat exchanger in which the draining property of condensed water is improved by applying hydrophilic machining to the leeward side end part of a porous tube.

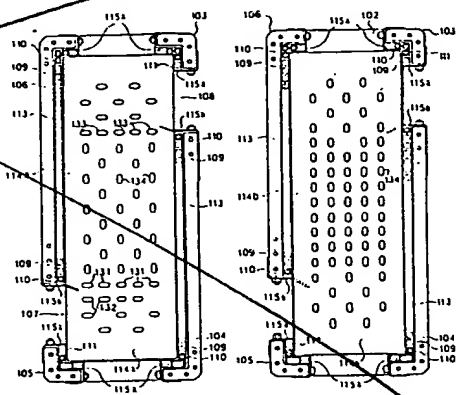
CONSTITUTION: A coolant inlet tube 3 and a coolant outlet tube 5 are brazed to the opening end of a porous tube 1, and thereafter a hydrophilic film 20a is coated on the rear end portion of the leeward porous tube 1. When air flows into the heat exchanger from the direction shown by an arrow A, the moisture contained in air is condensed on the porous tube 1 which has been cooled to a temperature lower than the dew point of air by a coolant within the tube and the surfaces of fins 2, and the moisture grows to water drops within the heat exchanger. The water drops 10 are blown together to the leeward side end part of the porous tube in accompaniment with an airstream along the surfaces of the fins. Since a hydrophilic film 20a is coated on the leeward side end part of the porous tube, draining downward of the heat exchanger is excellently carried out along the porous tube. That is, in the vicinity of the porous tube, water film streams along the direction of the leeward tube end and the downward of the longitudinal direction of the porous tube are constantly formed. Waterdrops at the leeward end parts are drained smoothly by being guided by the waterdrops. Hence, waterdrops are prevented from splashing into the compartment of a car in accompaniment with the airstream.



(54) COUNTERFLOW FLOATING PLATE TYPE HEAT EXCHANGER
(11) 62-252891 (A) (43) 4.11.1987 (19) JP
(21) Appl. No. 61-96285 (22) 25.4.1986
(71) SUMITOMO HEAVY IND LTD (72) KORETAKA ISHIKAWA(1)
(51) Int. Cl⁴. F28D9/00,F28F3/04,F28F3/10

PURPOSE: To obtain a counterflow type heat exchanger which is excellent in a heat exchange efficiency by heat-exchanging fluids having different temperatures therebetween through respective floating plates, and causing the fluids having different temperatures to flow in mutually opposite directions in a predetermined division in the direction of the long side of a channel.

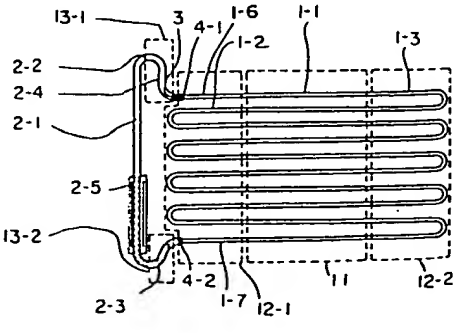
CONSTITUTION: A low-temperature fluid flows from the long side of a heat exchanger toward directly above a floating plate 114a and a high-temperature fluid flows from the short side thereof to directly below a floating plate 114b. The floating plates 114a and 114b are provided with dimples protruding toward the surfaces of the floating plates 114a and 114b, respectively. Dimples 131 of the floating plate 114a are designed to cause air to flow uniformly, whereas dimples 133 define the flow quantity of air at the outlet side. Dimples 134 introduce air in parallel to the upper part of the heat exchanger, and dimples 132 introduce air into the inner part of the heat exchanger without impairing the dynamic pressure possessed by air supplied. The dimples 132 on the floating plate 114b are all arranged by aligning their long diameters toward the flow direction of the fluid so as not to prevent the fluid from flowing. As a result, a heat-exchange performance of high efficiency as a counterflow type heat exchanger can be displayed.



(54) MEANDERING LOOP SHAPED HEAT PIPE
(11) 62-252892 (A) (43) 4.11.1987 (19) JP
(21) Appl. No. 61-93896 (22) 23.4.1986
(71) AKUTORONIKUSU K.K. (72) HISATERU AKACHI
(51) Int. Cl⁴. F28D15/02

PURPOSE: To obtain a high-density stage row arrangement structure using extremely thin heat pipes by circulating a working liquid while repeating alternately evaporation and condensation, causing an evaporating part and a condensing part to act as a single heat pipe, and forming as a whole a series connected body of a large number of heat pipes, and arranging respective heat pipes at predetermined positions and predetermined postures by predetermined shape meandering.

CONSTITUTION: A working liquid circulating in one direction circulates by alternately repeating evaporation and condensation. The combination of a set of an evaporating part and a condensing part acts as one heat pipe. The entire meandering part of the heat pipe is a series connect body of a large number of heat pipes, and respective heat pipes are arranged at predetermined positions and predetermined postures by the meandering arrangement of a long tube container. In the case of heating a body 11 to be controlled of its temperature, containers 1-2 and 1-3 are heated by heating means 12-1 and 12-2, and held at a temperature higher than that of a straight tube container 1-1. In the case of cooling the body 4 to be controlled of its temperature, the containers 1-2 and 1-3 are cooled by cooling means 12-1 and 12-2 and held at a temperature lower than that of the straight tube container 1-1.



1-3: U-shaped curved tube container. 2-2: U-shaped curved tube. 2-3: U-shaped curved tube, working liquid reservoir. 2-4: working liquid reservoir. 13-1,13-2: cooling means